Willow Valley Allotment Evaluation Summary

Introduction

An Allotment Management Plan (AMP) was completed for this allotment in 1986, when it was part of the larger Stateline Allotment. During 1987, the Stateline Allotment was divided into three separate allotments including the Willow Valley Allotment. During 1987 and 1988 a grazing management system was proposed and agreed to by the BLM and the permittees. This system, which will be outlined later, has been used from 1987 through 1997 with some minor modifications. The Klamath Falls Resource Area Record of Decision and Resource Management Plan and Rangeland Program Summary, June 1995,(ROD/RMP/RPS), proposed a reduction of 220 animal unit months (AUMs) and a change in the season of use from 4/21 - 6/20 to 4/15 - 6/30.

The purpose of this evaluation is to assess whether or not current management practices are meeting the multiple use objectives for the allotment and to determine the appropriate stocking level, season of use, and grazing system for the various pastures. The allotment will also be evaluated to determine if the Standards for Rangeland Health are being met.

Allotment Profile

The Willow Valley allotment (0890) is a category "I" allotment, with 20,460 federal acres and 887 private acres. The allotment is located in the south end of the Gerber Block, an approximately 112,000 acre block of Bureau of Land Management (BLM) administered public land surrounding Gerber Reservoir in eastern Klamath County.

The permittees on the allotment are John Anderson, Dennis Hitt, and Johnson Stock Company. The allotment boundary is completely fenced and contains 5 separate fenced pastures. A riparian area known as Duncan Springs is fenced and currently excluded from livestock grazing. Several waterholes and springs have been developed throughout the allotment to provide dispersed water sources for livestock and wildlife. Three reservoirs were developed in the allotment to provide irrigation water for private lands downstream. These are Willow Valley Reservoir (10,800 Acre feet), Antelope Reservoir (800 Acre feet), and Kilgore Reservoir (2,206 Acre feet). Two perennial streams are also found within the allotment. Antelope Creek flows into Willow Valley Reservoir and the East Branch of the Lost River begins at the outflow of this reservoir.

The upland areas of the allotment are characterized by a mix of perennial and annual grasses and forbs within a matrix of sagebrush and juniper trees. Stringers of ponderosa pines are found throughout the allotment and ponderosa pine/shrub woodlands are in the eastern and southeastern portions. In the Willow Valley Chaining pasture, 1,450 acres of mixed age juniper trees were chained and the area was seeded to a mix of non-native grass and forb species during 1967-68.

Initial Use Level

Livestock Use

All livestock use on this allotment is by cattle, mainly cow-calf units with some bulls. The total number of animal unit months of specified livestock grazing for the allotment is 1,320 AUMs. There are 444 suspended nonuse AUMs. Of these totals, there are currently 120 AUMs of active and 40 AUMs of suspended specified livestock grazing that are unallocated. These AUMs became open for application following the sale of 160 acres of the base property. The new owners of the base property failed to make application for these AUMs within 90 days of the date of sale in accordance with 43 CFR 4110.2-3(4)(b). The decision to not allocate these AUMs until allotment evaluations were completed is contained in the Notice of Area Managers Proposed Decision dated March 4, 1997. This decision was not protested and thus became final. The final decision was not appealed.

At present, the AUMs are allocated to the permittees as follows:

Anderson	744 AUMs active	250 AUMs suspended
Hitt	366 AUMs active	124 AUMs suspended
Johnson Stock	90 AUMs active	30 AUMs suspended
Unallocated	120 AUMs active	40 AUMs suspended
TOTAL	1320 AUMs active	444 AUMs suspended

There are currently no exchange-of-use AUMs authorized for the private lands within the allotment.

The current season of use on the allotment is April 15 through June 30. This corresponds to the change proposed in the ROD/RMP/RPS.

Wildlife Use

The ROD/RMP/RPS wildlife allocation for this allotment is 960 AUMs for mule deer and 141 AUMs for antelope for a total of 1,101 AUMs for wildlife. The deer and antelope normally move from the Clear Lake area in California into the Willow Valley area in early spring. They normally disperse throughout the Gerber Block and surrounding areas in the summer. In the late fall and early winter they then migrate back to the Clear Lake area. During mild winters, some mule deer can be found in lower areas of the Gerber Block.

There is a building population of elk in the area. Currently, no allocation is made for this elk use. As the population develops and use patterns become more established, allocations may be made for this elk herd.

Grazing System

The allotment is divided into five pastures: Willow Valley Chaining, Woolen Canyon, Notch Corral, Antelope, and Antelope Riparian. The Antelope Riparian Pasture was established in 1989. It contains both public and private land and is designed to provide wildlife habitat around Antelope Reservoir. It has been scheduled for livestock use only once since then, but has received use by unauthorized livestock on an annual basis due to lack of fence maintenance. Unauthorized livestock use has also occurred on an almost annual basis in the Duncan Springs riparian exclosure

The other four pastures have been managed on a four pasture, rest rotation system, however, the schedule has been inconsistent. Fall use has been made on the Antelope pasture and this pasture has not been rested since 1987. Willow Valley reservoir acts as a barrier between the Woolen Canyon and Notch Corral pastures. During the 1992 season, drought conditions lowered the level of the reservoir and the two pastures were grazed together. The Willow Valley Chaining pasture was not used in 1996 and 1997 due to planned prescribed fire plans for the pasture. This burning was completed in 1997.

Changes in permittees have also resulted in varied grazing schedules and livestock numbers. Johnson Stock Company was the only permittee grazing from 1991-1993. Silas Kilgore was a permittee up until 1993 when he sold his base property to Hitt. Prior to this, Kilgore had taken several years of nonuse. John Anderson became a permittee in 1997 after acquiring a portion of the Johnson Stock Company base property. Both Hitt and Anderson have livestock which spend the winter and early spring in California. This has resulted in some turnout dates that were later than April 15. Anderson and Hitt also have different breeding programs and have desired to keep their livestock in separate pastures. This has been accommodated in most years.

ROD/RMP/RPS Resource Management Objectives

Allotment Specific Objectives

Management objectives were identified for grazing allotments through public input and BLM interdisciplinary team interactions during development of the ROD/RMP/RPS. The following objectives are specific to the Willow Valley allotment:

1. Maintain or improve rangeland condition and productivity through a change in grazing management practices, timing, and/or level of active use.

2. Allocate forage to meet elk forage demands.

3. Prevent significant risk to well-being of special status species and/or habitat from BLM-authorized actions.

4. Improve wetlands habitat condition to satisfactory or better condition.

5. Maintain and improve riparian or aquatic habitat in good or better habitat condition.

6. Maintain and improve water quality on public lands to meet or exceed standards for beneficial uses, as specifically established by the Department of Environmental Quality, where BLM authorized actions are having a negative effect on water quality.

7. Revise existing allotment management plan.

ROD/RMP/RPS Allowable Use Guidelines

Upland Areas

Allowable use is the degree of forage utilization considered desirable, given our best understanding of proper use, and attainable on various parts of the range or allotment considering the present nature and condition of the resource, management objectives, and level of management. Proper use is a maximum degree of utilization of the current years growth which, if continued, will maintain or improve the long-term productivity of the site. Proper use varies with the year, season, the ecological site, the physiological requirement of the plant species, associated species, kind of livestock and species of wildlife, past grazing use, and other factors.

The following degrees of allowable use from the ROD/RMP/RPS were developed as a set of definitive criteria to assist in managing rangeland vegetation on a sustained yield basis. This table is meant to be used as an area guideline and will be tempered by site specific judgement and experience during the evaluation and activity planning efforts.

Degree of Allowable Use (by Percentage) for Upland Areas

Plant Category	Spring	Summer	Fall	Season-long
Perennial grasses & grasslike	50	50	60	50
Perennial & biennial forbs	50	50	60	50
Shrubs, half shrubs & trees	30	50	50	45
Annual grasses & forbs	**	**	**	**

** No annuals are expected to be key species

Riparian-Wetland Areas

Riparian zones and wetlands will be managed to protect, maintain, or improve riparian habitat for wildlife and native plant diversity. Grazing management practices in riparian zones will either provide for regrowth of riparian plants or leave sufficient vegetation after use for maintenance of proper functioning condition. Proper functioning condition exists when adequate vegetation, land form, or large woody debris are present to: dissipate stream energy associated with high water flows; filter sediment, capture bedload and aid floodplain development; improve flood water retention and groundwater recharge; develop stabilizing root masses, create aquatic habitat; and insulate streams from summer and winter extremes.

Grazing strategies will be developed for managing riparian-wetland areas in grazing allotments. These strategies will normally involve a combination of features. One of the main features will be allowable use guidelines. Allowable use of forage is based upon the amount of forage that will be left at the end of the overall grazing season or the end of the growing season, whichever is later. These guidelines will generally follow the utilization standards below, which include cumulative annual use by big game and livestock:

Maximum Annual Utilization (percent) in Riparian Areas

Utilization Standards in Riparian-Wetland Areas	Proper Functioning Condition		Functional-At Risk or Nonfunctioning	
	Herbaceous	Woody	Herbaceous	Woody
Riparian Areas with Management	50	50	0-40	0-35
Riparian Areas without Management	40	30	0-30	0-25

Standards for Rangeland Health

The following Standards for Rangeland Health will be assessed as part of this allotment evaluation in accordance with 43 CFR 4180.

Standard 1 - Watershed Function - Uplands
Upland soils exhibit infiltration and permeability rates, moisture storage and stability that are appropriate to soil, climate, and land form.

Standard 2 - Watershed Function- Riparian/Wetland Areas
Riparian-wetland areas are in properly functioning physical condition appropriate to soil, climate, and land form.

Standard 3 - Ecological Processes
Healthy, productive and diverse plant and animal populations and communities appropriate to soil, climate, and land form are supported by ecological processes of nutrient cycling, energy flow and the hydrologic cycle.

Standard 4 - Water Quality
Surface water and groundwater quality, influenced by agency actions , complies with State water quality standards.

Standard 5 - Native, T&E, and Locally Important Species
Habitats support healthy, productive, and diverse populations and communities of native plants and animals (including special status species and species of local importance) appropriate to soil, climate, and land form.

Summary of Monitoring Studies Data

Table 1 in the Appendix shows the monitoring studies that have been established in the Willow Valley allotment.

Key Species

Key species used during monitoring studies have varied. The main grass species surveyed include Idaho fescue (*Festuca idahoensis*), Thurbers needlegrass (*Stipa thurberiana*), Bottlebrush squirreltail (*Elymus elymoides*, formerly *Sitanion hystrix*), Bluebunch wheatgrass (*Pseudoroegneria spicata spicata*, formerly *Agropyron spicatum*) and bluegrass species (*Poa spp*.). Antelope bitterbrush (*Purshia tridentata*) is the shrub species surveyed during browse studies

Precipitation Data

Precipitation data for this evaluation is from the National Weather Service in Medford, Oregon. The collecting station is located at Kingsley Field, Klamath Falls. Precipitation data will be used to calculate a yield index for each year (Sneva et al. 1983). The yield index is used as a predictor of the percentage above or below the long term average a given years forage production was, e.g. in 1991 the forage produced was about 77% of normal. The yield index will be used to adjust the utilization levels for above or below normal precipitation. In calculating the yield index, the first step is to calculate the crop yield (effective precipitation). This includes precipitation falling from September 1 through June 30. The crop yield is then divided by the normal crop yield (30 year average) to determine the precipitation index for the year. The yield index is then calculated using the linear regression equation $Y = -23 + 1.23x$, where Y is the yield index and x is the precipitation index. Since the correlation between plant growth and crop year precipitation diminishes the more the precipitation varies from the 30 year average, the yield index adjustments will not exceed 50% or 150%. For example, if the crop yield index was 160% of normal, 150% will be used. If the crop yield index was 41% of normal, 50% will be used. Following are the yield indexes for the years 1991-1998 along with the adjusted index that will be used in calculating utilization:

Year	Yield Index	Adjusted Index
1991	0.77	0.77
1992	0.42	0.50
1993	1.89	1.50
1994	0.69	0.69
1995	1.92	1.50
1996	2.00	1.50
1997	1.43	1.43
1998	1.52	1.50

Actual Use Data

Actual use data shows livestock use
Average actual use figures for each pasture are summarized below. Figures for individual years are shown in Table 2 in the Appendix.

Willow Valley Chaining Pasture

1992,94,95,& 98 - 371 AUMs

Woolen Canyon Pasture

1993,94,& 97 - 344 AUMs

Notch Corral Pasture

1993,95,97,& 98 - 309 AUMs

Antelope Pasture

1992,93,95,97,& 98 - 148 AUMs

Utilization Studies Data

Annual forage utilization figures for each pasture are summarized below. These were derived by using a weighted average calculation of the utilization monitoring point readings in each pasture for each year. The weighted average for each monitoring point is based on acreage calculations that were determined when the monitoring points were established in 1985. Each utilization monitoring point was assigned an acreage figure which represents the percentage of the pasture and forage production being monitored at that point.

As an example, Point 1 represents 1500 acres in a 4500 acre pasture which would be 33% of that pasture and would represent 33% of the forage production for that pasture. Point 2 represents 3000 acres which would be 66% of the pasture and forage production. Utilization readings at Point 1 were 55% and at Point 2 were 35%. Using the weighted average, Point 1 would be 55% x 33% = 18% and Point 2 would be 35% x 66% = 23%. Adding these together would give a weighted average utilization of 41% for the pasture.

Yearly figures for each monitoring point and the weighted average utilization calculations are shown in the attached Table 2 in the Appendix. The annual figures for each pasture are summarized below along with an average utilization for all the given years:

Willow Valley Chaining Pasture

1992 = 30%
1994 = 36%
1995 = 32%
1998 = 36%
Average = 33.5%

Woolen Canyon Pasture

1993 = 73%
1994 = 19%
1997 = 44%
Average = 45.3%

Notch Corral Pasture

1993 = 53%
1995 = 22%
1997 = 24%
1998 = 22%
Average = 30.3%

Antelope Pasture

1992 = 16%
1993 = 44%
1995 = 41%
1997 = 50%
1998 = 24%
Average = 35%

Ecological Site Inventory

An Ecological Site Inventory (ESI) was completed for this allotment during 1997 and 1998. The inventory looks at the soil resources and the present vegetation community in relation to the historic climax plant community. Other parameters surveyed include soil erosion, ground cover percentages, and several soil attributes. For this evaluation, species composition and production data will be analyzed to produce a similarity index. A similarity index is the present state of vegetation on an ecological site in relation to the kinds, proportions, and amounts of plants of the Potential Natural Community. It is derived by taking the observed actual production from the site (#/acre) divided by the Reference Ecological Site Production (#/acre) multiplied by the Ecological Status Rating (% of climax vegetation). The values for the individual pastures will be presented.

Willow Valley Chaining Pasture

As noted earlier, in the Willow Valley Chaining pasture, 1,450 acres of mixed age juniper trees were chained and the area was seeded to a mix of non-native grass and forb species during 1967-68. The objective for this portion of the pasture is to maintain the introduced vegetation species and manage the livestock use accordingly. The remainder of this pasture has native stands that will be compared to the climax plant communities.

ESI Site #	Reference Ecological Site	Reference Production #/acre	Site Production #/acre	Ecol. Status Rating	Similarity Index
DLE98015	Juniper Loamy Hills 10-14"	1200	450	60	23%
DLE98018	Juniper Claypan 11-14"	800	400	47	24%
DLE98017	Shallow Stony 10-20"	250	225	48	43%
DLE98016	Shallow Stony 10-20"	250	300	46	55%
DLE98013	Juniper Loamy Hills 10-14"	1200	250	51	11%

Woolen Canyon Pasture

ESI Site #	Reference Ecological Site	Reference Production #/acre	Site Production #/acre	Ecol. Status Rating	Similarity Index
DLE98049	South Slope 14-18"	900	700	85	66%
DLE98029	Shallow Stony 10-20"	250	300	62	74%
DLE98021	South Slope 14-18"	900	450	55	28%
DLE98019	North Slope 14-18"	1000	500	62	31%
DLE98002	Juniper Claypan 11-14"	800	350	70	31%
DLE98001	Juniper Claypan 11-14"	800	375	47	22%
DLE97032	Juniper Claypan 11-14"	800	300	50	19%
DLE97028	Juniper Claypan 11-14"	800	250	33	10%

Notch Corral Pasture

ESI Site #	Reference Ecological Site	Reference Production #/acre	Site Production #/acre	Ecol. Status Rating	Similarity Index
DLE97027	Stony claypan 14-20"	800	375	79	37%
DLE97026	Juniper Claypan 11-14"	800	775	79	77%
DLE97025	Juniper Mahogany 16-20"	800	275		
DLE97024	Juniper Claypan 11-14"	800	900	87	98%
DLE97023	Juniper Claypan 11-14"	800	250	73	23%

DLE97019	Juniper Dry Pine 14-16"	1000	200	70	14%
DLE97018	Juniper Claypan 16-20"	800	500	86	54%

Antelope Pasture

ESI Site #	Reference Ecological Site	Reference Production #/acre	Site Production #/acre	Ecol. Status Rating	Similarity Index
DLE97017	Stony claypan 14-20"	800	725	80	73%
DLE97016	Claypan 14-20"	800	725	79	72%
DLE98012	Shallow Stony 10-20"	250	225	60	54%
DLE98011	Claypan 14-20"	800	650	71	58%
DLE98009	Juniper Claypan 16-20"	800	525	86	56%

Antelope Riparian Pasture

ESI Site #	Reference Ecological Site	Reference Production #/acre	Site Production #/acre	Ecol. Status Rating	Similarity Index
DLE98043	Dry Meadow	1400	1400	68	68%
DLE98042	Dry Meadow	1400	1400	54	54%

Observed Apparent Trend and Soil Surface Factor

Two other parameters of the ESI inventory are the Observed Apparent Trend (OAT) and the Soil Surface Factor (SSF). The OAT involves an ocular estimate of the following site factors: vegetation vigor, seedlings present, surface litter, soil pedestals, and gullies. Numerical ratings were assigned to each individual site factor based on conditions observed. A total point rating is then recorded at each site. The Observed Apparent Trend is based upon the following total point scale: 26-35=Upward, 17-25=Static, and 7-16=Downward.

The Soil Surface Factor involves an ocular estimate of the following site factors: soil movement, surface litter movement, surface rock distribution, pedestaling, flow patterns, rills, and gullies. Individual numerical ratings were assigned and a total point rating are recorded at each site. Erosion Condition Classes are based on the following total point scale: 0-20=Stable, 21-40=Slight, 41-60=Moderate, 61-80=Critical, and 81-100=Severe.

Willow Valley Chaining Pasture

ESI Site #	OAT	SSF
DLE98013	12	58
DLE98015	15	54
DLE98016	16	49
DLE98017	20	41
DLE98018	26	32

Woolen Canyon Pasture

ESI Site #	OAT	SSF
DLE98049	29	18
DLE98029	19	44
DLE98021	23	49
DLE98019	27	24
DLE98002	20	33
DLE98001	23	49
DLE97032	13	55
DLE97028	11	53

Notch Corral Pasture

ESI Site #	OAT	SSF
DLE97027	20	49
DLE97026	27	20
DLE97025	21	25
DLE97024	29	20
DLE97023	27	23
DLE97019	22	31
DLE97018	25	28

Antelope Pasture

ESI Site #	OAT	SSF
DLE97017	28	21
DLE97016	25	41
DLE98012	14	52
DLE98011	25	28
DLE98009	19	35

Antelope Riparian Pasture

ESI Site #	OAT	SSF
DLE98043	30	13
DLE98042	32	18

Utilization Mapping

Utilization pattern maps have been completed for the Willow Valley allotment for the following years: 1992-1995, 1997, and 1998. Observed utilization patterns were mainly keyed to location of water sources and topography. Levels of utilization were directly related to actual use figures and precipitation amounts. Most years showed slight to light use over 80% of the allotment with light to heavy levels near the water sources. There is a lack of many "natural" riparian areas in this allotment. Constructed reservoirs and waterholes provide 90% of the water. The East branch of the Lost River below Willow Valley Reservoir does have some areas that are used heavily. Another area that is heavily used is the springy area in the drainage below Antelope Reservoir. Distribution does not appear to be a major problem on the allotment. Some of the waterholes are in need of repair and/or cleaning to increase their capacity and provide longer term water sources. This would help with distribution.

Riparian and wetland Proper Functioning Condition (PFC) surveys

PFC surveys were completed for Antelope Creek in 1996 and for the East Branch Lost River in 1997. Within this allotment, there are approximately 3.5 miles of Antelope Creek above the Willow Valley reservoir. Of this, about 2.4 miles are within an exclosure fence. Below Willow Valley reservoir is about 3.7 miles of the East Branch Lost River. The Antelope Creek section outside of the exclosure and the East Branch Lost River are both within the Woolen Canyon pasture. The exclosure area forms the boundary between the Woolen Canyon and Notch Corral pastures.

The 2.4 miles of Antelope Creek within the exclosure was rated as being in Proper Functioning Condition. It was noted that excessive sediment was present on the creek bottom which was attributed to livestock activity upstream from the exclosure. Outside of the exclosure, 0.8 miles were rated as Nonfunctional and 0.3 miles were rated as Functional-At Risk with no apparent trend. On the Nonfunctional stretch, the channel was noted as being too wide with raw banks and lacking in good riparian vegetation. In some areas, there was both lateral and vertical instability due to active erosion. The Functional-At Risk section did not have a good riparian vegetation component and the channel should have more sinuosity.

The East Branch Lost River was rated as being in Proper Functioning Condition. There is a diversion that takes about 80% of the flow during the summer months. This probably narrows the extent of the riparian area below the diversion.

There have been no surveys done on the wetlands or springs within the allotment. These are planned to begin in 2001.

Data Analysis

Monitoring data will be analyzed separately for each pasture in the allotment

Willow Valley Chaining Pasture

For the years 1992,94,95, and 1998, the average actual use in this pasture was 371 AUMs. During these years, the weighted average forage utilization for the six utilization points in the pasture was 33.5%, adjusted for precipitation. Looking at each point separately during the individual use years (Appendix 1), only one point, #6, received use that was higher than the objective of 50%.

Utilization maps completed for this pasture show mainly slight to light use overall with any moderate or greater use located near water sources. As noted earlier, the western portion of this pasture was chained and seeded in the late 1960's. This area was prescription burned in the fall of 1997 with an approximate 20-30% coverage. Good regrowth of the seeded Agropyron species has been noted. This area has had light to moderate utilization in most use years and appears to be the preferred area for livestock use. This portion of the pasture should continue to be managed as a seeding.

The Ecological Site Inventory data for this pasture had 5 sites outside of the seeded area.

> The 2 Juniper Loamy Hills sites both had late seral ecological status but were rated as fair condition due to low production. The Observed Apparent Trend(OAT) is downward for both sites and the erosion class is moderate.
>
> The 1 Juniper Claypan site was rated as mid seral but also had low production. The amount of juniper has increased from historic levels with 10-30 trees/acre in the 12-20' and 20+' groupings. This is likely due to past heavy grazing which has made conditions less favorable for stand reducing fires. The OAT for this site is at the low end of upward and the erosion class is slight.
>
> The 2 Shallow Stony sites were both rated as mid seral ecological status with average production. Both sites had cheatgrass and medusahead present and a higher than desired component of junipers. Erosion is moderate on both sites and OAT is downward and on the low end of stable.

There are 8 Photo Trend plots located within this pasture. These were established at the time of the juniper chaining and all plots are within the chained portion of the pasture. All plots appear to have an upward trend with increased amounts of grasses present. Young junipers are starting to increase in some of the plots. Plots 1 & 6 were retaken after the prescribed fire in 1998 and some of the young junipers were burned, but many remain due to the mosaic fire pattern. The grasses in these two plots were not affected much by the bum. Residual matter was burned, but

most of the individual plants were still in good condition with good resprouting evident in the photos.

Woolen Canyon Pasture

For the years 1993, 94, and 97, the average Actual Use was 365 AUMs. During these years, the weighted average forage utilization for the five utilization study areas in the pasture was 45%, adjusted for precipitation. During 1993, utilization was over 50% for all points.

In reviewing the individual data sheets, there are many notes about the poor range conditions and the scarcity of the key species. Medusahead, cheatgrass, and other annual grass and forb species are noted on the data forms.

Utilization maps for this pasture show mainly light use overall. During 1993, there were areas of heavy use west of Willow Valley Reservoir and moderate use in other parts of the pasture.

The Ecological Site Inventory data for this pasture contains 8 sites:

> The 4 Juniper claypan sites all had low production, with a range of 250-375#/acre. The average production for these sites should be 800#/acre. These sites also had a high number of juniper trees in all size categories. In the 3-12' and 12-20' size categories, three of the sites were in the 10-30 trees/acres range. All sites also had 5-10 old growth junipers per acre. The OAT was Static on 2 sites and Downward on 2 Sites. The SSF was Moderate on 3 sites and Slight on 1 Site.
>
> The 1 Shallow Stony site had good production with a strong bluegrass component. Squirreltail composition was high which indicates past disturbance. Yampah was abundant, as it is on most Shallow Stony sites in the Gerber Block. The OAT was Static and the SSF was Moderate.
>
> The 2 South Slope and 1 North Slope sites are representative of only a small percentage of the pasture. They are located on steep canyon sides and rock escarpments. The South Slope site DLE98021 had more past grazing use than the other two sites and was rated as Fair condition.

Photo Trend plot WV-2 was established in 1975 in the Woolen Canyon pasture. The photos have shown a static to downwards trend. Perennial grasses were limited in all the photos, but the ones present in the early photos died out and were not replaced. Most photos were taken in July or August and have little evidence of forbs other than phlox and what appear to be seedstalks from yampah and epilobium. The 1993 photo was taken in June and shows a lot of forb seedlings.

Condition studies were read in 1983 and 1996. The method for the data collection for the 1983

data is not recorded, but this data was normally recorded through an ocular survey of the site. The 1996 data was collected through a clip and weigh transect. The following changes in the composition by weight between the 1983 and 1996 data were noted:

Idaho fescue - 2.0 to 5.8%
Sandbergs Bluegrass - 17.0 to 1.8%
Squirreltail - 10.0 to 4.7%

Both years show a low percentage of Idaho fescue for this ecological site. The Juniper Claypan site should have 30-40% Idaho fescue in the Potential Natural Community. Squirreltail is also present which indicates past disturbance factors. The large change in Sandbergs bluegrass may be due to misidentification in 1983. The data could also have been collected in a shallower soil site where Sandbergs bluegrass tends to be a dominant species.

A Frequency Trend plot was established in 1996 near the Photo Trend studies site. This study will be reread in 2001 to give an indication of the trend in vegetation composition and cover. One note from this initial reading is that the occurrence of the key species of Idaho fescue and Thurbers needlegrass appears to be low for this ecological site.

The riparian survey for Antelope Creek showed a Nonfunctioning condition for most of the stretch within this pasture. The East Branch Lost River was rated as being in Proper Functioning Condition. The excluded portion of Antelope Creek that acts as the eastern boundary for this pasture was rated as being in Proper Functioning Condition.

Notch Corral Pasture

For the years 1993, 95, 97, & 98, the average actual use was 309 AUMs. During this same period the weighted average forage utilization was 28%, adjusted for precipitation. During 1993, 4 of the 6 utilization points had use of greater than 50% on Idaho fescue, with a high of 62%. This year also had an actual use of 395 AUMs, the highest of the 5 years monitored.

Utilization maps for this pasture show mainly slight to light use in all years. Some moderate to heavy use has been noted at Timber Hill reservoir and along the shore of Willow Valley reservoir. Utilization and distribution does not appear to be a problem in this pasture. Waterholes are well distributed and normally have water during the grazing season, except in drought years.

The Ecological Site Inventory for this pasture had 7 sites:

There are 3 Juniper Claypan, 11-14" sites. One of the sites was located on a rocky knoll and had low production due to the high amount of stones, cobbles, and gravels (67% total). It did have late seral ecological status, though. The other 2 sites had high production levels and PNC ecological status. Both sites had a good percentage of Idaho

fescue and Bluebunch wheatgrass. Both of these sites also had a juniper component with larger trees and greater than 10 old growth/acre.

The 1 Juniper Claypan, 14-20" site had lower than average production, but had PNC Ecological Status with a high percentage of Idaho fescue. This site also had a high amount of stones and cobbles. The juniper component had 10-30 trees/acre in the 3-12' and 12-20' ranges. There were also 5-10 trees/acre in the 20+ and old growth categories.

The 1 Stony Claypan site had lower than normal production with a high percentage of climax vegetation. This site had experienced heavy grazing pressure in the past and had a lot of small junipers invading the site.

The 1 Juniper-Mahogany-Fescue site had low production with late seral vegetation. The site was located near a reservoir and had received heavy grazing pressure due to the water and shade from the larger junipers found there (30-60/acre in the 20+' size range).

The 1 Juniper-Pine-Bunchgrass site had low production with late seral vegetation. These type of areas are used for shade by livestock and also receive moderate grazing.

A Photo Trend plot was established in this pasture in 1975. It is located within a Juniper Claypan ecological site (the 1997 Condition Study refers to it as a Stony Claypan site, but subsequent ESI surveys show the area as Juniper claypan). Photos were taken in 1976, 77, 78, 79, 81, 85, 93, & 97. The trend appears to be static to upwards. The amount and size of the Idaho fescue plants remained constant with some stress during the drought period in the early 1990's, but good recovery in the 1997 photo. There appears to be some new fescue plants that have established.

A Condition study and a Frequency Trend study were established in 1997. The condition study showed a late seral vegetation community and a production level of 529.5#/acre which corresponds well with the ESI sites in the area. There was a lack of Bluebunch wheatgrass in this survey, probably due to higher grazing frequency on the gentle terrain and the lack of large rocks. Bluebunch is a favored cattle forage and it has most likely been grazed out of this site. A good cover of Idaho fescue is still present. The trend study showed a good frequency of Idaho fescue and Sandbergs bluegrass, but trend can not be determined until the next reading in 2002.

Antelope Pasture

For the years 1992, 93, 95, 97, & 98 the average actual use in the Antelope Pasture was 148 AUMs. During this same period, the weighted average utilization was 35%. Two of the four utilization points were greater than 50% during 1993 (68 & 57%) and two points were greater than 50% in 1997 (72 & 77%).

The utilization maps for this pasture show mainly slight to light use in areas away from the

reservoirs. Use around Kilgore and Antelope reservoirs and the irrigation drainage that runs out of these two reservoirs has been moderate to heavy. Antelope Reservoir is mainly on private land with the dam being on BLM. Kilgore reservoir is on BLM land. A private ranch has the water rights for both reservoirs.

The Ecological Site Inventory for this pasture had 5 sites:

> There were 2 Claypan 14-18" sites. One of the sites had a good production level and a PNC ecological status. It was noted that some small junipers were starting to invade this site. This site also had an SSF rating of moderate. The other site also had good production and was in late seral ecological condition.
>
> The 1 Shallow Stony 10-20" site had below average production and a Late Seral ecological status. It also had a moderate SSF rating.
>
> There were 2 Juniper Claypan 16-20" sites. Both sites had below average production, but were rated as PNC ecological sites.

A Photo Trend plot was established in 1975. The trend appears to be Static to Upwards with similar amounts of grasses and more litter evident in the later photos. Some of the sagebrush appears to have died off after an Aroga moth infestation was noted in 1977. From the wide view photo, it does not appear that there has been a significant increase in juniper in the last 23 years.

Condition studies were read in 1983 and 1996. The method for the data collection for the 1983 data is not recorded, but this data was normally recorded through an ocular survey of the site. The 1996 data was collected through a clip and weigh transect. The following changes in the composition by weight between the 1983 and 1996 data were noted:

> Idaho fescue- 35 to 46%
> Sandberg's bluegrass- 7 to 11%
> Onespike oatgrass- 15% to Trace
> Squirreltail- 3 to 1%
> Low sagebrush- 35 to 22%

Comparing these readings with the ESI site writeup for this ecological site shows similar amounts:

> Idaho fescue- 40%
> Sandberg's bluegrass- 10%
> Onespike oatgrass- 7%
> Squirreltail- 6%
> Low sagebrush- 15%

The ESI sites oatgrass level is similar to the 1983 data due to the nature of the data collection

method of walking over a larger area. The 1996 data was collected from a transect. Oatgrass tends to grow in small drainage areas where water remains a little longer in the spring. The Idaho fescue and Sandberg's bluegrass percentages are at PNC levels for this site. Production levels for all 3 readings were a little lower than the average for this site.

A Frequency Trend study was initiated in 1996. Good cover percentages of Idaho fescue and Sandberg's bluegrass were noted, but a trend can not be determined until after the next reading in 2001.

Antelope Riparian Pasture

The Antelope Riparian pasture was licensed for use during 1998. Some unauthorized use has been noted during 1992-1996. Fence repairs were completed in 1998 to help alleviate this problem.

Utilization levels in 1992 and 1998 were 30% and 11%. Actual use during these periods was not determined. The 1992 use was unauthorized and the 1998 use was for a week while the livestock were in the adjoining Antelope pasture.

Utilization maps for this pasture in 1992 showed heavy to severe use around the spring at the north side of the pasture with moderate to heavy use in other portions. Other years showed some light use when mapping was done, but the scheduled rest years were not normally mapped.

A Riparian Photo Point was established in this pasture in 1989 and it was rephotographed in 1998. There is not much apparent change in the vegetation. This is mainly a wet meadow area with dense vegetation near the photo point which didn't show much change. The one change noted in the photos was the addition of a constructed goose island in the 1998 photo.

ROD/RMP/RPS Resource Objectives Review

Allotment Specific Management Objectives

1. Maintain or improve rangeland condition and productivity through a change in grazing management practices, timing, and/or level of active use.

   This objective is being met on the majority of the allotment. There are some condition problems in large areas of the Woolen Canyon pasture and in portions of the other pastures. The RMP objectives were developed in 1995 when the plan was written and problems had been identified. A grazing rotation had been adopted, but has not been followed due to the many ownership changes and drought conditions in the early 1990's. With the monitoring data we now have and the ESI data, it is more apparent that there are condition problems that need to

be addressed. This objective also needs to be made more measurable and realistic based upon the present data.

2. Allocate forage to meet elk forage demands.

   This objective is not currently being met as no forage has been allocated to elk. There is a building population of elk in this area. As the population develops and use patterns become more established, allocations may be made for this elk herd.

3. Prevent significant risk to well-being of special status species and/or habitat from BLM-authorized actions.

   This objective is being met on the allotment. There are no known special status plant species in the allotment. Lahontan cutthroat trout have been seen in Antelope Creek above Willow Valley Reservoir. These trout were stocked in the creek and are not native to Oregon. Presently, they are not considered a special status species in Oregon.

   A historic sage grouse lek is located in the Woolen Canyon pasture. As more information and guidance on the management of sage grouse habitat becomes available, changes in current management may be made.

4. Improve wetlands habitat condition to satisfactory or better condition.

   Adequate progress is being made in meeting this objective. The Antelope Riparian Pasture is a large wetland area that receives only limited grazing pressure. The wetlands appear to be in good condition with occasional spotty heavy grazing from unauthorized use. No surveys of other wetland habitat have been done in this allotment, but the only other areas would be associated with constructed waterholes and springs. A survey of wetlands in the resource area will be initiated in 2001.

5. Maintain and improve riparian or aquatic habitat in good or better habitat condition.

   This objective is not being met on the allotment. The portions of Antelope Creek located in the Woolen Canyon pasture were rated as Nonfunctioning during surveys in 1996.

   The three large reservoirs, Willow Valley, Antelope, and Kilgore all have private water rights which allow the holders of the rights to draw water for irrigation purposes. Also, about 90% of Antelope Reservoir is on private land. These factors limit the BLM management of the aquatic habitat associated with these

reservoirs.

6. Maintain and improve water quality on public lands to meet or exceed standards for beneficial uses, as specifically established by the Department of Environmental Quality, where BLM authorized actions are having a negative effect on water quality.

   This objective is being met on the allotment. Water quality surveys of Antelope Creek have been done on a semi-annual basis with results that meet the standards.

7. Revise existing allotment management plan.

   This objective will be met on the allotment through this evaluation. An allotment management plan (AMP) will not be completed, but recommended changes in management will be initiated through this evaluation which serves as an AMP functional equivalent.

ROD/RMP/RPS Allowable Use Guidelines

Upland Areas

The allowable use for upland areas is 50% for the season of use and key species in this allotment.

The average annual utilization for all pastures was below 50% for all the years monitored. There were a few individual points that were above 50% in each of the pastures. These figures correspond to years when the actual use was higher than the average. This shows a need to set an actual use level for each pasture based upon utilization levels from monitoring studies.

Riparian Areas

There are currently no utilization points in the riparian areas. Points should be established on Antelope Creek, East Branch Lost River, and on the drainage below Antelope Reservoir.

Standards for Rangeland Health

The following Standards for Rangeland Health will be assessed as part of this allotment evaluation in accordance with 43 CFR 4180.

Standard 1 - Watershed Function - Uplands
Upland soils exhibit infiltration and permeability rates, moisture storage and stability that are appropriate to soil, climate, and land form.

The indicators used to evaluate this standard are the results of the various trend and condition studies; utilization studies; plant community composition and structure; and various other resource attributes observed during the recent ESI including Soil Surface Factor (SSF), which estimates the level of soil surface erosion, and ground cover components (plant litter, rock material, biotic crusts, bare ground).

This standard is being met on the majority of the allotment. The various studies and ESI components sited above as indicators affirm that the uplands are in a functional state. The one area where there may be shortfalls is in the vegetation composition. Some areas of the Willow Valley Chaining and Woolen Canyon pastures have vegetation conditions that are in the low to mid seral state and production levels that are much lower than average. These areas have high levels of introduced species like cheatgrass, medusahead, and various weedy forbs. Junipers have also increased in numbers and are becoming established in ecological sites outside of their natural range. The increase in non-native species and the expansion of junipers is beginning to cause a shift in the vegetation communities in some sites. This is leading to increased overland flow due to the decreased perennial vegetation cover. The junipers and cheatgrass also use water throughout a larger portion of the soil profile and earlier and later in the growing season. This may lead to a decrease in available soil moisture and a subsequent lowering of the water table in some areas.

Management actions to address the non-native species and the juniper invasion will be addressed in the Management Recommendations section of this evaluation.

Standard 2 - Watershed Function- Riparian/Wetland Areas
Riparian-wetland areas are in properly functioning physical condition appropriate to soil, climate, and land form.

This standard is not being met on all of the allotment. The section of Antelope Creek above the Duncan Springs exclosure was rated as Nonfunctional during Proper

Functioning Condition surveys in 1996. Other riparian areas that were surveyed were rated as Proper Functioning Condition or Functional-At-Risk.

The Nonfunctioning section of Antelope Creek is an intermittent stream that flows in the spring and during heavy rainfall events. Much of the flow from upstream is diverted to Antelope Flat, a private meadow, for irrigation. Water that is contained in Antelope and Kilgore reservoirs is used to irrigate Antelope Flat in the late spring and summer. Excess flow from this irrigation flows through this section of Antelope Creek. Rock check dams were constructed by the BLM in the early 1990's in this section of the creek. Small pools that typically hold water through the summer have formed behind these structures.

Through the Nonfunctioning section there is some riparian vegetation present, but not enough to dissipate the energy during high flows or to effectively capture sediments. There are also areas where the stream banks are lacking vegetation and have been eroded by a combination of livestock hoof action and high water flows.

This section of Antelope Creek needs time to reestablish a good vegetative cover. This will require a change in the grazing management for this area that results in lower vegetation utilization levels and decreased stream bank impacts. These changes are outlined in the Management Recommendations section of this evaluation. This section of Antelope Creek is situated between private land and the exclosure fence that protects the perennial flows below Duncan Spring. Fencing this section of the creek would probably result in little additional benefit, compared to the proposed change in grazing management. The creek will be monitored to determine if the proposed grazing changes result in upwards trends. If not, the need for fencing will be re-evaluated.

An assessment of the standing water riparian areas has not been completed for this allotment. This would include reservoirs, springs, seeps, and seasonal wetlands. When an evaluation of these areas is completed, appropriate management changes will be made as necessary to correct any Nonfunctional ratings.

Standard 3 - Ecological Processes
Healthy, productive and diverse plant and animal populations and communities appropriate to soil, climate, and land form are supported by ecological processes of nutrient cycling, energy flow and the hydrologic cycle.

This standard is being met on the majority of the allotment. The data collected during the ESI and evaluated throughout this document indicate that productive native plant communities are present throughout the allotment to support the dependent resources. As mentioned in Standard 1, there are some areas in the Willow Valley Chaining and Woolen Canyon pastures where exotic grasses have invaded and juniper has expanded causing a shift in the vegetation communities. This may be causing a change in the nutrient cycling, energy flow, and hydrologic cycle due to the ability of these plants to use

soil water and nutrients in differing quantities and at different times of the year than the native plant communities. These areas will be addressed in the Management Recommendations section of this evaluation.

Standard 4 - Water Quality

Surface water and groundwater quality, influenced by agency actions, complies with State water quality standards.

It is unknown whether this standard is being completely met on the allotment. No stream segments in the allotment are on the State 303(d) list of water bodies that do not meet water quality standards. However, water quality studies have only been done on the perennial section of Antelope Creek. No studies have been done on East Branch Lost River, the upper sections of Antelope Creek or the reservoirs within the allotment. Monitoring of these areas will be addressed in the Management Recommendations section of this evaluation.

Standard 5 - Native, T&E, and Locally Important Species

Habitats support healthy, productive, and diverse populations and communities of native plants and animals (including special status species and species of local importance) appropriate to soil, climate, and land form.

This standard is being met on the allotment. ESI surveys show that most of the allotment supports native vegetation communities. Some introduced species have become established and in some areas are out-competing the native plants. Junipers are also increasing in some areas to the detriment of the established vegetation. Some of these sites will be addressed in the Management Recommendations section of this evaluation.

There are no special status species plants or animals in the allotment.

The Rangeland Health Standards Assessment Determination signature page is located in the Appendix of this document.

Management Recommendations

Grazing System

A rest rotation system should be maintained to permit periodic rest which allows for the recruitment of new seedlings, enhancement of plant vigor, and the building of root reserves for future seed production. Deferred grazing in a pasture after the rest year should also be used where practical to allow a better chance for new seedling establishment. The season of use of 4/15 to 6/30 should be maintained, but flexibility should be allowed based upon the current years climatic conditions and the needs of the permittees.

Pasture AUM allocations

Allocation of AUMs for each pasture is based on several factors:

- Utilization monitoring from past years adjusted for precipitation
- Production data from ESI surveys
- Condition data from ESI surveys
- Soil erosion and observed apparent trend portions of the ESI data
- Utilization pattern mapping from past years
- Professional judgement and knowledge of the allotment

Willow Valley Chaining Pasture

The chained and seeded portion of the pasture is supporting a good stand of introduced species. Monitoring and ESI data for the rest of this pasture shows that the vegetation communities are in mid to late seral ecological status, but overall production is low. There are also areas that are heavily invaded by undesirable grass species and weedy forbs. Livestock use has been mainly in the seeded portion of the pasture with light use in the native portions of the pasture, mainly near waterholes. Based on this, utilization should be set at 40% to allow more of the native perennials to produce seed and increase in vigor. This will also allow for more residue to be left resulting in better soil protection and water infiltration.

Using 1992, 94, 95, & 98 utilization and actual use monitoring data, the following formula was used to determine a stocking rate: X = Actual Use x Desired Utilization Actual Utilization where X = Desired Capacity. The mean figure for the four years was **442 AUMs**.

Woolen Canyon Pasture

This pasture is in the poorest condition of all the pastures. Monitoring and ESI data show low production throughout the pasture and many areas invaded by undesirable grass species and weedy forbs. Junipers have increased to a level in many areas where they are negatively affecting the vegetation communities. There is also a stretch of Antelope Creek that was rated as nonfunctional due to heavy livestock impacts. Based on the low production levels and the large areas in only fair condition, utilization should be set at 30%. This will allow for less use on the native perennials, giving them a chance to increase in vigor, establish root reserves, and produce seed. This will also help lessen the impacts on Antelope Creek.

Using 1993, 94, & 97 utilization and actual use monitoring data, the following formula was used to determine a stocking rate: X = Actual Use x Desired Utilization Actual Utilization, where X

= Desired Capacity. The mean figure for the three years was **304 AUMs**.

Notch Corral Pasture

This pasture has the best condition in the allotment and has had good livestock distribution. ESI condition data show areas of late seral and PNC vegetation with good production levels in some areas and lower than average in others. Junipers are increasing in many areas and may begin to affect the vegetation community structure. Based on these factors, utilization should be set at 50% to maintain and/or improve the vegetation conditions.

Using 1993, 95, 97, & 98 utilization and actual use monitoring data, the following formula was used to determine a stocking rate: X = Actual Use x Desired Utilization Actual Utilization, where X = Desired Capacity. The mean figure for the four years was **573 AUMs**.

Antelope Pasture

This pasture has two large reservoirs which tend to concentrate the livestock use. Use mapping shows moderate to heavy use in the areas around the reservoirs and along the drainages below the reservoirs. Better distribution of the livestock is needed which will be addressed under Pasture Rotation below. The ESI condition data shows late seral and PFC vegetation. Production levels vary from below average to average. Based on these factors, utilization should be set at 50% to help maintain and/or improve the vegetation conditions.

Using 1993, 95, 97, & 98 utilization and actual use monitoring data, the following formula was used to determine a stocking rate: X = Actual Use x Desired Utilization Actual Utilization, where X = Desired Capacity. The mean figure for the four years was **231 AUMs**.

Antelope Riparian Pasture

This pasture was designed to maintain and improve wetland habitat. It's use by livestock should continue to be limited. No separate AUMs will be assigned to this pasture. It should only be used for a 10 day period concurrent with use in the adjoining Antelope Pasture.

AUM Summary and Grazing System

The combined total of the AUM figures for the individual pastures would be 1550 AUMs for the allotment. In order to implement an effective rest rotation system, a reduction in this total must be figured. Only 3 of the 4 main pastures will be used in any year, so a reasonable number of

AUMs should be deducted to insure that utilization levels are not greatly exceeded on the use pastures. With a rest rotation system, the desired utilization levels in a pasture could be exceeded during one or two of the use years considering that it will be rested every fourth year. The RMP allowable use guideline for upland utilization is 50%. The levels recommended above for individual pastures vary from 30% to 50%. Actual field utilization may exceed 50% at any given utilization point in any given year depending upon livestock use patterns, available water sources, etc. But the long term goal of the recommended AUM levels is an improvement in the resources in the individual pastures and in the allotment as a whole.

With this in mind, the current AUM allocation for the allotment is 1320 AUMs with 120 AUMs temporarily suspended. This results in an active use level of 1200 AUMs. Using this AUM level in a four pasture rest rotation system would result in some utilization that could be higher than the desired utilization levels. This would occur in the smaller pastures, Woolen Canyon and Antelope, during years when the larger pastures, Notch Corral and Willow Valley Chaining, are rested. With a rest rotation system, these slightly higher use levels are balanced by the rest years. The larger pastures also receive some higher use levels during the rotation, but these are also balanced during rest years and when the smaller pastures are rested.

One of the operators, Dennis Hitt, normally does not bring livestock onto the allotment until early to mid May. Also, there are concerns about the operators different livestock breeding programs. Anderson breeds for fall calving and Hitt and Johnson Stock breed for spring calving. Due to this difference and the late turn on by Hitt, a rotation that keeps Hitt's livestock separate from the others is being proposed.

The following is the proposed pasture rotation using the 1200 AUM level. This is based on the season of use of 4/15 to 6/30 for 294 head of Anderson cattle and 36 head of Johnson Stock cattle. Hitt's season of use is 5/10 - 6/30 with 213 head of cattle. All pastures receive rest for one year out of four except for the Willow Valley Chaining pasture. One year out of four it will receive very light use in the spring (63 AUMs). The Willow Valley Chaining pasture is the most convenient one to use as the first pasture every year due to its proximity to the permittee's private lands. It also has soil types that dry out earlier in the spring allowing for less problems associated with wet soils. The Antelope Riparian pasture will be used one year out of four and in conjunction with use on the Antelope pasture.

Proposed Pasture Rotation

Year	Willow Valley Chaining	Woolen Canyon	Notch Corral	Antelope	Antelope Riparian
2001	And. & J.S. 4/15-5/28 477 AUMs	REST	Hitt 5/10-5/28 And. & J.S. 5/29-6/30 491 AUMs	Hitt 5/29-6/30 231 AUMs	REST
2002	And. & J.S. 4/15-5/31 510 AUMs	And. & J.S. 6/1-6/30 325 AUMs	REST	Hitt 5/20-6/30 294 AUMs	Hitt 5/10-5/19 70 AUMs
2003	Hitt 5/10-5/18 63 AUMs	Hitt 5/19-6/30 300 AUMs	And. & J.S. 4/15-6/8 597 AUMs	And. & J.S. 6/9-6/30 239 AUMs	REST
2004	Hitt 5/10-6/30 364 AUMs	And. & J.S. 4/15-5/11 293 AUMs	And. & J.S. 5/12-6/30 542 AUMs	REST	REST

And. = John Anderson, J.S. = Johnson Stock
AUM figures are based upon use by the following livestock numbers: Anderson - 294, Johnson Stock - 36, Hitt - 213.

This pasture rotation and AUM level should be used for two full cycles, eight years, and then reevaluated. Utilization mapping should be completed on an annual basis and utilization point monitoring should be completed annually for the first full rotation.

Range Improvements

- An updated range improvement maintenance agreement should be developed with the current permittees. Recent changes in ownership and levels of AUMs/permittee makes

this necessary. A new agreement for the Antelope Riparian pasture also needs to be developed due to the ownership changes.

- A complete inventory of existing waterholes and springs should be done to determine any maintenance or repair needs. Several of the waterholes are in need of cleaning to restore their storage capacity. Exclosure fences around the springs and some of the waterholes are also in need of repairs. These maintenance needs will be coordinated with the permittees.

- An inventory of the condition of the allotment boundary and pasture fences should also be completed. This could be done in cooperation with the permittees.

- Juniper control options should be looked at for many areas in the allotment, especially those ecological sites that would naturally have little or no juniper as a component.

- A request has been made by one of the permittees to fence separately the east end of the Antelope Riparian pasture. The fence would separate the wetland area on the west from the upland vegetation on the east end. This new area on the east end would be combined with private land to the north to create a gathering pasture. This would allow the permittee a place to gather his livestock on the moves to and from the Bear Valley allotment.

- The upper section of Antelope Creek that has been rated as Nonfunctioning may need to be fenced to exclude livestock if conditions do not improve with the new pasture rotation system that will be implemented. The need for fencing will be determined by the additional monitoring that will be implemented as outlined in the **Monitoring** section below.

Resource Objectives

The current RMP objectives for this allotment need to be made more specific to the resources present. The objectives need to be clear and quantifiable statements of desired values to be achieved within a stated time period. The ESI data provides a good basis for setting desired vegetation community objectives. Riparian and water quality objectives should be specific to the riparian resources present in the allotment. These objective should be developed as an interdisciplinary process with input from the permittees and other interested agencies and publics.

Wildlife Allocation

The current AUM allocation for wildlife, 960 AUMs for deer and 141 AUMs for antelope,

should remain the same. All monitoring studies incorporate the use made by wildlife and livestock. When utilization monitoring results show use above the desired levels, livestock allocations are adjusted. This in turn provides the wildlife with additional forage. Cole Browse studies have consistently shown very little use by livestock of shrub species that wildlife are dependent on. There is a building population of elk in this area. As the population develops and use patterns become more established, allocations may be made for this elk herd.

Monitoring

The current range monitoring program should be continued with a few changes and additions:

- As noted above, use mapping and utilization point monitoring will be completed on an annual basis to determine the effectiveness of the management changes. Increased use supervision will also be done in the allotment to provide data on livestock distribution and numbers. Actual use data will continue to be recorded by the permittees.

- The key management areas and utilization points need some field review to determine their adequacy in representing the current conditions and grazing patterns. This will be done during monitoring visits.

- The section of Antelope Creek that was rated as Nonfunctional should have additional annual monitoring to determine if the changes in the grazing management are resulting in a decrease in livestock use and in increase in riparian conditions. This monitoring will include weekly observations of livestock use during the use period for Woolen Canyon pasture, end of the season Streambank Stability ratings, and continuance of the Riparian Photo Points on an annual basis.

- The drainage below Antelope Reservoir should be considered for a monitoring point.

- The photo trend plots should be continued. A vegetation species “map” similar to the ones prepared in the 70's and early 80's should be completed for the plots. This would help with species identification in the plots.

Appendix

Table 1

Willow Valley Allotment Monitoring Studies

The following abbreviations are used in the table:

Util. Pts.- Utilization Points
P. Trend - Photo Trend
F. Trend - Frequency Trend
C. Browse - Cole Browse
RPP - Riparian Photo Point
Year Est. - Year Established

Other notes on the table contents are found at the end of the table.

Pasture Name	Existing Study(s)	Year Est.	Year(s) Read or to be Estab.	Years Scheduled for Reading in Future
All	Util.Pts (21) **1/**	84-86	84-88,90-95 **3/** 97-99	2001,03,05
	Use Pattern Map **1/**	1992	92-95,97,98	As necessary **4/**
W.V.Chain.	P.Trend (WVC-1)	1967	67-71,78-79,81, 85,93,98	2003,08
	P.Trend (WVC-2)	1967	67-71,78-79,81, 85,96,99	2004,09 **6/**
	P.Trend (WVC-3)	1967	67-71,78,81,85, 96	2001,06 **6/**
	P.Trend (WVC-5)	1967	67-71,78-79,81, 96	2001,06 **6/**
	P.Trend (WVC-6)	1967	67-71,73,78-79, 81,85,88,93,98	2003,08
	P.Trend (WVC-7)	1967	67-71,73,78-79, 81,85,88,96	2001,06 **6/**
	P.Trend (WVC-8)	1967	67-68,71,78-79, 81,85,96	2001,06 **6/**

	F.Trend	N/E	See comments/notes	
	Condition	N/E	See comments/notes	
Woolen C.	P.Trend (WV-2)	1975	75-79,81,85,87, 93-94,99	2004,2009
	F.Trend	1996	1996	2001,2006
	Condition(WV-2)	1983	1983,96	**10/**
	C.Browse(890-1)	1991	91-92,93-94,99-	-00,04-05 **2/**
	RPP (4 pts) **5/**	1992	1992-93,96	2000,03,06
	RPP (6 pts) **9/**	1990	1990,95,98	2001,04
Notch C.	P.Trend (WV-3)	1975	75-79,81,85,93, 97	2002,2007
	F.Trend	1997	1997	2002,2007
	Condition	1997	1997	**10/**
	C.Browse(890-2)	1991	91-92,93-94, 98-99	2003-04 **2/**
Antelope	P.Trend (WV-1)	1975	75-79,81,85,87, 93,98	2003,08
	F.Trend	1996	1996	2001,2006
	Condition (WV-1)	1983	1983,96	**10/**
	C.Browse(890-3)	1991	91-92,93-94, 98-99	2003-04 **2/**
Antelope	(Pasture infrequently used - util. read when used)			
Riparian	RPP	1989	1989,98	2001,04
Duncan Spr./Antelope Creek/E.Fork Lost River Riparian exclosure				
	RPP(3pts) **7/**	1979	79,89,92,96	2000,03,06
	RPP(5pts) **8/**	1977	77-81,84,87,89, 90,92,93,96	2000,03,06

1/ When utilization points and use pattern mapping are done, all utilized pastures are read. The number in parentheses is the number of utilization points in the allotment.

2/ Cole Browse studies are typically read two times for a given growth year: first in the fall after livestock use, and again in the spring after winter big game (deer or elk) use.

3/ In 1994, the Antelope pasture was inadvertently missed for utilization reading; both the points and the mapping.

4/ A use pattern map will be prepared in the "out years" if deemed necessary due to changes in observed use patterns, management changes, etc. during reading of the utilization points. Use pattern maps will be done every 3-5 years otherwise.

5/ These Riparian Photo Points (RPP) studies are/were read on the Antelope Creek drainage above the Duncan Springs exclosure - points AC-R-13 through 16.

6/ These photo points had not been found in recent years; they were located

and photographed in 1996.

7/ These Riparian Photo Points (RPP) are/were read within the Antelope Creek/E.Fork Lost River/Duncan Springs exclosure - points LR-2 through LR-4 (LR-1 and LR-5 are repeats of PS-2 and PS-5, respectively).

8/ These Riparian Photo Points (RPP) are/were also read within the Antelope Creek/E.Fork Lost River/Duncan Springs exclosure - points DS-1 through DS-5 (also noted as PS-1 through PS-5 in the photo binder).

9/ These Riparian Photo Points (RPP) are/were read within the E. Fork Lost River, below Willow Valley Reservoir - points ELR-1 through ELR-6. Photos were only taken in one year (when points established in 1990) although two separate sets of photos were taken - one in June and one in August. Photo's retaken in 1995 and 1998.

10/ The key area condition plot would be re-read every ten years, or if the accompanying trend transect shows a significant vegetation change that would indicate downward trend.

Comments/Notes:

- The Antelope Creek or East Fork Lost River or Duncan Springs exclosure goes by many names. It is the same exclosure. It forms the boundary between the Woolen Canyon and Notch Corral pastures and is immediately northeast of Willow Valley Reservoir.

- At present there is no plan to put a frequency trend and condition study(s) within the Willow Valley Chaining pasture; the photo trends should be adequate since this pasture is largely made up of altered vegetation - chained and seeded in the late 60's.

Table 2
Utilization Studies

Willow Valley Chaining Pasture

Use Period	4/15-5/25/98	5/20-6/21/95	4/25-6/7/94	4/22-5/25/92
Actual Use	396 AUMs	325 AUMs	434 AUMs	329 AUMs
	Util. % Adjusted Index of (1.50)	Util. % Adjusted Index of (1.50)	Util. % Adjusted Index of (0.69)	Util. % Adjusted Index of (0.50)
Point # Weighted %	FE/ST	FE/ST	FE/ST	All Grass
6 27%	50 (75)	22 (33)	48 (33)	42 (21)
7 16%	20 (30)	18 (27)	52 (36)	49 (25)
8a 17%	7 (11)	16 (24)	56 (39)	72 (36)
8b 10%	33 (50)	20 (30)	53 (37)	50 (25)
9 12%	10 (15)	22 (33)	56 (39)	68 (34)
10 18%	10 (15)	30 (45)	50 (35)	84 (42)
Pasture Adjusted Utilization %	36%	32%	36%	30%

Desired Capacity	440 AUMs	406 AUMs	482 AUMs	439 AUMs

- A utilization reading was not taken at this point, the figure used is from the utilization map completed for this pasture. The figure represents the midpoint of the utilization class that was mapped for this area. For example - Slight utilization has a range from 6-20% with a midpoint of 13%.

Desired Capacity based upon 40% desired utilization using the following formula:
X = Actual Use x Desired Utilization Actual Utilization where X = Desired Capacity

Woolen Canyon Pasture

Use Period	5/6-6/13/97	6/8-7/8/94	4/21-5/31/93
Actual Use	385 AUMs	306 AUMs	404 AUMs
	Utilization % Adjusted Index of (1.43)	Utilization % Adjusted Index of (0.69)	Utilization % Adjusted Index of (1.50)
Point # Weighted %	FE/ST	FE/ST	FE/ST
1 34%	39 (56)	17 (12)	47 (71)
2 21%	33 (47)	25 (17)	40 (60)
3 20%	16 (23)	24 (17)	36 (54)
4 10%	16 (23)	64 (44)	73 (110)
5 15%	39 (56)	29 (20)	63 (95)
Pasture Adjusted Utilization %	44%	19%	73%
Desired Capacity	263 AUMs	483 AUMs	166 AUMs

Desired Capacity based upon 30% desired utilization using the following formula:

X = Actual Use x Desired Utilization Actual Utilization where X = Desired Capacity

Antelope Pasture

Use Period	5/20-7/7/98	6/14-7/6/97	9/15-9/28/95	9/1-9/22/93	9/3-9/21/92
Actual Use	101 AUMs	227 AUMs	138 AUMs	152 AUMs	121 AUMs
	Util. % Adjusted Index of (1.50)	Util. % Adjusted Index of (1.43)	Util. % Adjusted Index of (1.50)	Util. % Adjusted Index of (1.50)	Util. % Adjusted Index of (0.50)
Point # Weighted %	All Grass	All Grass	All Grass	All Grass	All Grass
17 22%	20 (30)	23 (33)	22 (33)	45 (68)	30 (15)
18 28%	13 (20)	13 (19)	13 (20)	10 (15)	14 (7)
19 30%	17 (26)	54 (77)	29 (44)	38 (57)	21 (11)
20* 100%	7 (11)	--		--	60 (30)
21 20%	13 (20)	50 (72)	50 (75)	25 (38)	74 (37)
Pasture Adjusted Utilization %	24%	50%	41%	44%	16%
Desired Capacity	210 AUMs	227 AUMs	168 AUMs	173 AUMs	378 AUMs

*Point 20 is in the Antelope Riparian pasture.

- Since Point 20 is now within the Antelope Riparian Pasture, the Weighted % for Points 17,18,19, and 21 were adjusted from the 1985 figures to reflect the current pasture boundaries.

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- A utilization reading was not taken at this point, the figure used is from the utilization map completed for this pasture. The figure represents the midpoint of the utilization class that was mapped for this area. For example - Slight utilization has a range from 6-20% with a midpoint of 13%.

Desired Capacity based upon 50% desired utilization using the following formula:

X = Actual Use x Desired Utilization Actual Utilization where X = Desired Capacity

Notch Corral Pasture

Use Period	5/26-6/30/98	5/21-7/15/97	6/2-7/13/95	6/1-7/10/93
Actual Use	348 AUMs	288 AUMs	232 AUMs	395 AUMs
	Util. % Adjusted Index of (1.50)	Util. % Adjusted Index of (1.43)	Util. % Adjusted Index of (1.50)	Util. % Adjusted Index of (1.50)
Point # Weighted %	FE/ST	FE	FE	FE
11 20%	13 (20)	13 (19)	13 (20)	30 (45)
12 25%	7 (11)	13 (19)	10 (15)	37 (56)
13 14%	27 (41)	19 (27)	20 (30)	41 (62)
14 13%	25 (38)	34 (49)	25 (38)	35 (53)
15 13%	13 (20)	8 (11)	13 (20)	30 (45)
16 15%	8 (12)	16 (23)	10 (15)	40 (60)
Pasture Adjusted Utilization %	22%	24%	22%	53%

Desired Capacity	791 AUMs	600 AUMs	527 AUMs	373 AUMs

- A utilization reading was not taken at this point, the figure used is from the utilization map completed for this pasture. The figure represents the midpoint of the utilization class that was mapped for this area. For example - Slight utilization has a range from 6-20% with a midpoint of 13%.

Desired Capacity based upon 50% desired utilization using the following formula:

X = Actual Use x Desired Utilization Actual Utilization where X = Desired Capacity

Rangeland Health Standards Assessment Determination

The grazing management system that is being proposed as part of this Willow Valley allotment evaluation will promote achievement or significant progress towards the Oregon Standards for Rangeland Health and conform with the Guidelines for Livestock Grazing Management. The management system will be implemented during 2001.

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Teresa Raml Date
Manager, Klamath Falls Resource Area